

REMARKS

Claims 1-7 remain in this application. Claims 8 through 27 are withdrawn. Claims 28 through 34 are added. Claims 1 is amended.

Claim Rejections under 35 USC §112

The Office Action rejected claims 2, 4, 6, 7 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action stated that it is unclear to what is meant by the first signals comprise even numbered carriers eight through thirty less, carriers twelve and fourteen in claim 2 and that similar rationale is applied to claims 4, 6, and 7.

The rejection under 35 U.S.C. §112, second paragraph is respectfully traversed because the claims meet all the requirements of 35 U.S.C. §112. “Determining whether a claim is definite requires an analysis of ‘whether one skilled in the art would understand the bounds of the claim when read in light of the specification If the claims read in light of the specification reasonably apprise those skilled in the art of the scope of the invention, § 112 demands no more.’” *Personalized Media Communications, LLC v. U.S. Int’l Trade Comm’n*, 161 F.3d 696, 48 USPQ2d 1880 (Fed. Cir. 1998) (citing *Miles Lab., Inc. v. Shandon, Inc.*, 997 F.2d 870, 875, 27 USPQ2d 1123, 1126 (Fed. Cir. 1993) and finding that term digital detector is definite because the written description of the specification was sufficient to inform one skilled in the art of the meaning of the claim language).

The terms of claims 2, 4, 6 and 7 are clearly described in the specification. For example, *inter alia*, the specification at paragraph 13 states:

“[0013] The G.994.1 is used to handshake between two ADSL modems in order to select mutual line transmission method and operating parameters. When G.994.1 was originally developed in 1999, one of the significant design discussions centered on the selection of the carriers (tones) to be used for each ADSL annex. Annex C (ADSL in the presence of TCM-ISDN) was unable to use the same tones as Annex A or Annex B because of the disturbance from TCM-ISDN in the binder.”

The specification also states in paragraphs 27 through 29 (emphasis added) that:

“[0027] FIG. 5 is an illustration of a typical duplex start-up procedure initiated by a remote xDSL modem, transceiver (HSTU-R). Initially, the remote DSL transceiver is in state R-SILENT0 transmitting silence, and the central office DSL transceiver is in state C-SILENT1 transmitting silence. The remote DSL transceiver initiates the handshaking DSL procedure by transmitting first signals containing even numbered carriers for a predetermined period of time (e.g., up to two seconds) to initiate the DSL handshaking to produce R-ETONES-REQ. The first signals are signals from one or both of its signaling families (i.e., a group of carrier sets which are integral multiples of a given carrier spacing frequency, for example, 4.3125 KHz signaling family and 4 KHz signaling family) using only even numbered carriers, with phase reversals every 16 ms. *The even numbered carriers may be eight through thirty less, carriers twelve and fourteen.* After the transmission of the R-ETONES-REQ, the remote DSL transceiver may transmit conventional R-TONES-REQ in accordance with the G.994.1 specification until a response is received from the central office DSL transceiver or expiration of a time out period (e.g., a few seconds to tens of seconds).

[0028] As shown, the central office DSL transceiver (HSTU-C) detects the R-ETONES-REQ to produce detected R-ETONES-REQ subsequent to the commencing of their transmission. Upon detection, the central office DSL transceiver determines alignment of a hyperframe (i.e., as defined in G.992.1 specification) in accordance with a Time Compression Multiplexing Integrated Service Digital Network (TCM-ISDN) Timing Reference (TTR). Having determined the hyperframe alignment, the central office DSL transceiver transmits first response signals containing odd numbered carriers in accordance with the alignment of the hyperframe to produce C-TONES-TTR. *The first response signals are odd numbered carrier signals from one or both of its signaling families, where the odd numbered carriers include five through thirty-one, less carriers seven and nine.* In addition, the first response signals include periodic phase reversal (e.g., 16 millisecond (ms) phase reversal).

[0029] Upon receiving the C-TONES-TTR, the remote DSL transceiver resumes transmitting silence for 50 to 500 ms and attempts to acquire TTR synchronization from with the C-TONES-TTR. Upon acquiring TTR synchronization, the remote DSL transceiver transmits second signals containing even numbered carriers to produce R-TONE-TTR. *The second signals include even numbered carrier signals from only one signaling family, where the even numbered carriers may be eight through thirty, less carriers twelve and fourteen.*

[0030] In response to the R-TONE-TTR, the central office DSL transceiver transmits second response signals containing odd numbered carriers to produce C-GALF1-TTR. *The second response signals include Galfs on odd numbered modulated carriers five through thirty-one, less carriers seven and nine."*

The specification includes a description of the terms in claims 2, 4, 6 and 7. Thus, a person of skill in the art would be able to understand the bounds of the claim when read in light of the specification.

Claim Rejections under 35 USC §103

The Office Action rejected claims 1, 3 and 5 under 35 U.S.C. §103 as being unpatentable over U.S. Published Application No. 2003/0189952 to Long et al. (the Long reference) in view of US Patent 6,678,316 to Helms et al. (the Helms reference). Applicants respectfully traverse this rejection because neither the Long reference or the Helms reference, either alone or in combination, disclose or suggest the elements of the these claims.

Independent Claim 1 and Dependent Claims 3 and 5

Claim 1 states, "transmitting, by a remote DSL transceiver, first signals containing even numbered carriers for a predetermined period of time to initiate the DSL handshaking to produce R-ETONES-REQ, wherein the first signals comprise a plurality of even numbered carriers eight through thirty and include periodic phase reversal; detecting, by a central office DSL transceiver, the R-ETONES-REQ to produce detected R-ETONES-REQ; determining, by the central office DSL transceiver, alignment of a hyperframe in accordance with a Time Compression Multiplexing – Integrated Service Digital Network (TCM-ISDN) Timing

Reference (TTR); transmitting, by the central office DSL transceiver, first response signals containing odd numbered carriers in accordance with the alignment of the hyperframe to produce C-TONES-TTR, wherein the first response signals comprise odd numbered carriers five through thirty-one and include periodic phase reversal; acquiring, by the remote DSL transceiver, TTR synchronization in accordance with the C-TONES-TTR; upon acquiring TTR synchronization, transmitting, by the remote DSL transceiver, second signals containing even numbered carriers to produce R-TONE-TTR; in response to the R-TONE-TTR, transmitting, by the central office DSL transceiver, second response signals containing odd numbered carriers to produce C-GALF1-TTR; in response to the C-GALF1-TTR, transmitting, by the remote DSL transceiver, third signals containing even numbered carriers to produce R-FLAG1-TTR; and in response to the R-FLAG1-TTR, transmitting, by the central office DSL transceiver, third response signals containing odd numbered carriers to produce C-FLAG1.”

This embodiment of claim 1 describes a method to for extending handshaking range in a DSL system by helping to alleviate interference when a binder containing a number of twisted pair wires shared by xDSL modems and TCM-ISDN disturbers.

The combination of the Long reference and the Helms reference teaches away from the elements of claim 1. First, with respect to the Long reference, on page 4, the Office Action admits that the Long reference fails to disclose “transmitting initializing and response to handshaking in odd and even carriers.” In fact, the Long reference merely describes a specially defined TTR Indication signal to indicate the boundaries of a FEXT and NEXT bitmap, as described in paragraph 26 of the Long reference, and nowhere discloses the elements of claim 1.

With respect to the Helms reference, the Office Action states on page 5 that the handshaking method of Long may be modified with the transmission on odd and even carriers of Helms in order to eliminate near end crosstalk. However, the Helms reference teaches away from the elements of the claims. The Helms reference describes aligning the frames transmitted by all CO modems, e.g. all frames transmitted by all CO modems start and end at the same time, as stated at column 6, lines59 through 66. As stated at column 4, lines 61 through column 5, lines 8 in the Helms reference:

“It is a further principle of the present invention to align frames transmitted from the central office toward the subscriber. All frames transmitted by all

central office modems are aligned and synchronized to begin at the same time as they are transmitted toward subscribers. That is, all frames transmitted by all central office modems to all subscribers (especially served on the same cable of twisted wire pairs) start and end at the same times. One way to accomplish the alignment is to provide a common shared timing signal to all CO modems from a common source. For example, the signal may comprise a train of narrow, for example, 1 microsecond pulses spaced by the period of a frame (for example, one millisecond). Each central office modem then would align its frames that are transmitted toward respective subscribers over different twisted wire cable pairs with this pulse train.

The pulse train from the common source may be accompanied by a higher frequency signal (for example, a sinusoid or a pulse train at the frequency specified in Section 6.9 of ANSI T1.413-1995) to which each modem could be synchronized. Alternatively, the pilot tone of 276 kHz specified at Section 6.9.1.2 might be applied as the shared resource. Either alternative will save the costs of providing an oscillator within each central office modem.”

In addition, the Helms reference describes that the subscribers’ modems are designed to align the frames that it transmits with the frames that it receives so that its transmitted frame coincides with its received frame, at column 7, lines 16 through 20. The Helms reference then later states at column 7, lines 52 through 56, “Optionally, the frequencies used by the central office and subscriber modems can be interspersed – either individually or in groups-to virtually eliminate near end crosstalk (NEXT), provided *that the frames are aligned as described above* (emphasis added).” Thus, the Helms reference discloses that the frames must be aligned using some type of pulse train from the common source. This type of alignment precludes the need for DSL handshaking and thus teaches away from the embodiment of DSL handshaking between the remote DSL transceiver and the central office transceiver of claim 1.

The Office Action further states that, “It should further be noted that the use of even numbered carriers for upstream and odd number carriers for downstream is simply a network parameter.” However, the claims require more than “a network parameter”, and Applicant’s respectfully request citation of prior art showing this assertion. Furthermore, the Office

Action's reasoning is not the legal basis for obviousness. The proper analysis is whether the claimed invention would have been obvious to one of ordinary skill in the art after consideration of all the facts. See 35 U.S.C. 103(a).

For these reasons, neither the Long reference or the Helms reference, either alone or in combination, disclose or suggest the elements of claim 1. The dependent claims 2 through 7 add further patentable matter to Claim 1 and thus are further differentiated and patentable under 35 U.S.C. §103 over the Long reference in view of the Helms reference.

Independent Claim 28 and Dependent Claims 29 through 33

For similar reasons stated above with respect to claim 1, neither the Long reference or the Helms reference, either alone or in combination, disclose or suggest the elements of claim 28. The dependent claims 29 through 34 add further patentable matter to Claim 28 and thus are further differentiated and patentable under 35 U.S.C. §103 over the Long reference in view of the Helms reference.

CONCLUSION

For the above reasons, the foregoing amendment places the Application in condition for allowance. Should the Examiner have any further comments or suggestions, please contact Jessica Smith at (972) 240-5324.

Respectfully submitted,
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Dated: February 26, 2009

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